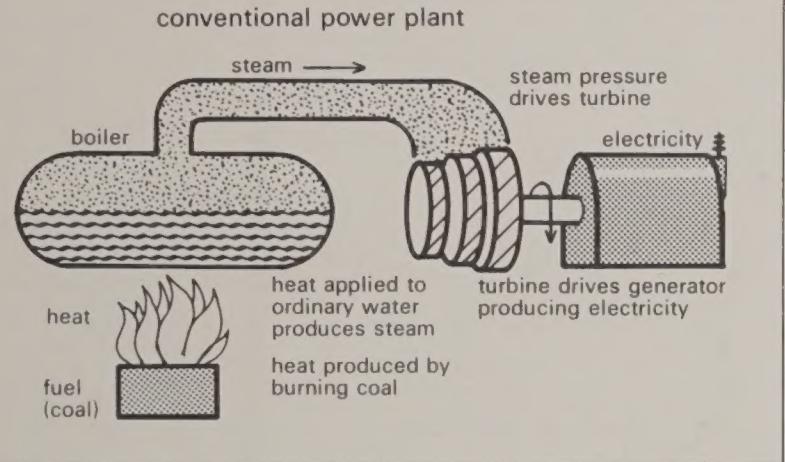
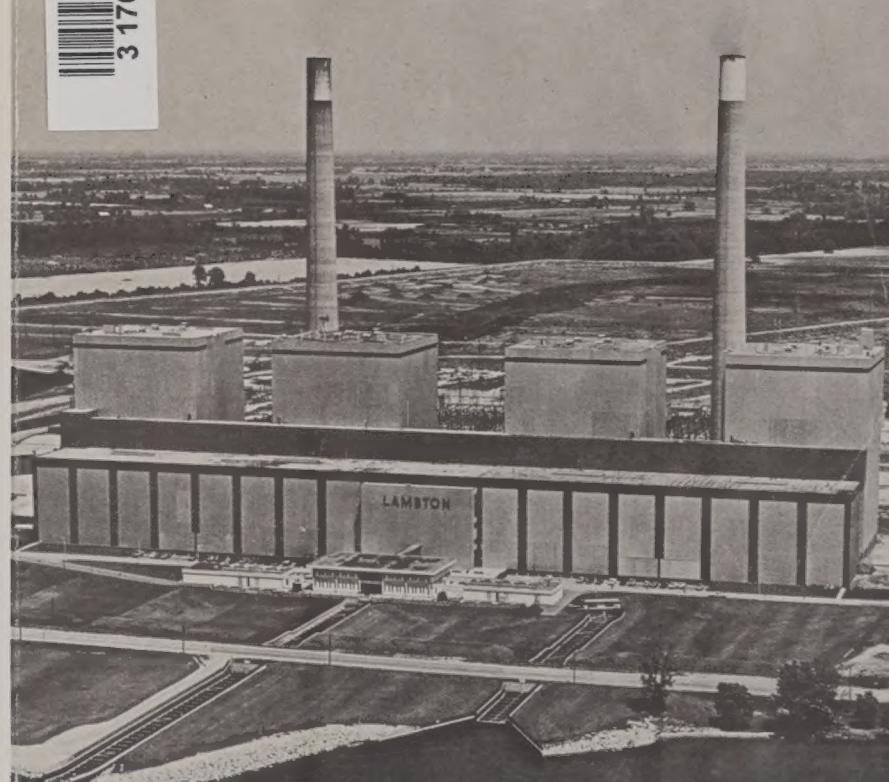


# Lambton generating station

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## Electricity From Coal

Electricity is produced when a magnet spins inside a coil of wire in a generator. In a hydraulic generating station, the spinning power is provided by turbines driven by falling water. Thermal stations, such as Lambton, use super-hot jets of high pressure steam to provide the propelling force for the turbines.

At Lambton, coal stored on site is transferred into the plant by conveyors, ground into a fine powder for faster combustion, and blown into the furnace where it immediately ignites and produces heat.

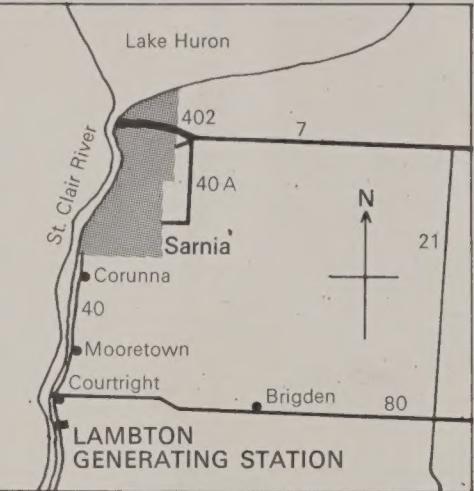
Water circulating through an intricate system of tubes surrounding the furnace is boiled by the heat and converted to steam. After passing through the hot furnace gases, the steam is superheated to 1000°F and fed to the first cylinder of the turbine at a pressure of 2,350 lbs per sq. inch. Here some of its energy is converted to mechanical work in rotating

the turbine shaft and thus driving the generator which is attached to it. To make further use of the steam it is returned to the boiler and again reheated to 1000°F. It is then passed through the remaining cylinders of the four-cylinder turbine, at each stage producing additional mechanical power to spin the generator.

Once the steam has completed this cycle, it is cooled by water from the St. Clair river and pumped back to the boiler as water to begin another cycle.

The mechanical energy produced by passing high pressure steam through the turbine drives the generator at 3,600 r.p.m. and is converted into electrical energy for transmission to the user over Ontario Hydro's high voltage network.

Each of the four generating units at Lambton has an electric power output of 500,000 kilowatts at full capacity. At full power, each unit will burn 190 tons of coal per hour.



## Visiting Lambton Generating Station

Special group tours of Lambton can be arranged by appointment. For information call any Ontario Hydro office, or Lambton Generating Station at Courtright 867-2663.



### Lambton

During the last half century, Ontario Hydro has progressively harnessed the water-power resources of the province and today operates hydro-electric plants on the major rivers. Only a few river sites remain which could be considered capable of economic development to produce electricity.

To keep pace with the expanding economy, Hydro must more than double its generating capacity approximately every ten years. Ontario Hydro is meeting this requirement by constructing large-scale fossil-fuelled and nuclear thermal electric plants.

Lambton Generating Station is among the largest coal-fired stations in North America. With a total capacity of 2,000,000 kilowatts — greater than the combined output of the Canadian plants at Niagara — it can produce enough power to meet the requirements of 1.3 million homes.

Electricity from Lambton is fed into Ontario Hydro's high voltage network which serves power users across the province.

### Facts About Lambton

**In-service date:** After more than five years planning and construction, first power was produced by Lambton in the Spring of 1969. Two units will be brought into service during 1969; two in 1970.

**Principal Structures:** The main powerhouse is a steel-framed, aluminum clad structure 940 feet long by 250 feet wide. The highest point of the structure, the boiler-house roof, stands 220 feet above ground. A two-storey administration block, 175 by 40 feet, is connected to the powerhouse by an enclosed corridor.

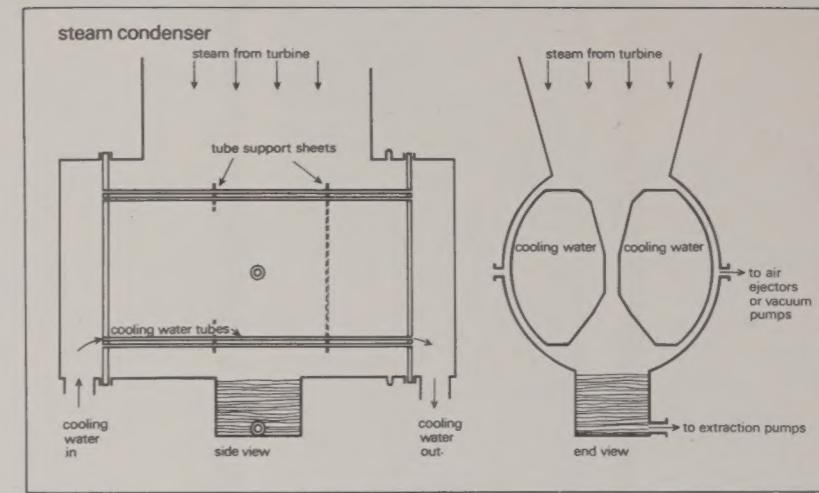
### Facts About Lambton

**Steam Generators:** Four boilers, each capable of producing 3,600,000 pounds of steam per hour at a pressure of 2,350 pounds per square per square inch. Steam is superheated and reheated to 1,000 degrees Fahrenheit.

**Turbine Generators:** Four 500,000 kilowatt units operating at 3,600 revolutions per minute.

**Electrical Power:** Total station capacity 2,000,000 kilowatts. Electricity is generated at 24,000 volts and transmitted to the Ontario Hydro grid at 230,000 volts.

**Staff:** Lambton is designed to be operated by a staff of approximately 220.



### Water

Like other Ontario Hydro thermal stations, Lambton has two separate water systems — a closed system within the plant to produce steam, and a flow-through system using river water for cooling.

Water used in the steam cycle is used over and over again and needs only minor replenishment. Cooling water, drawn from the St. Clair River at a rate of 536,000 gallons per minute of full operation, passes quickly through the condenser circuits and is returned to the river slightly warmer but in no way contaminated by its passage through the plant. There is no contact between river water and water used to produce steam.

### Air Quality Control

No thermal-electric generating station can be operated without some effect on the immediate environment. But at Lambton as at other Ontario Hydro thermal stations every practical step has been taken to minimize pollution.

Electrostatic precipitators trap 99.5 per cent of the dust in the gases leaving the boiler and store it for later removal. The combustion gases themselves are safely dispersed into the upper atmosphere by way of the 550 feet high stacks.

When climate conditions are such that dispersal of gases cannot be achieved within satisfactory limits, the station is equipped to change quickly to a special and much more expensive coal which produces less gases when burned.